MORRISON & FOERSTER

ATTORNEYS AT LAW

2000 PENNSYLVANIA AVENUE, N.W.
WASHINGTON, D.C. 20006-1888
TELEPHONE (202) 887-1500
TELEFACSIMILE (202) 887-0763
TELEX 90-4030 MRSN FOERS WSH

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Alan Baughcum
Federal Communications Commission
2000 M Street, N.W., Room 531
Washington, D.C. 20554

Re: Review of the Prime Time Access Rule; MM Docket No. 94-123

Dear Mr. Baughcum:

I am writing to follow up our discussion of last week. Please find enclosed the materials you requested from Professor Woroch relating to Noll, Peck & McGowan's welfare estimates.

In addition, Professor Woroch has reviewed the "Surrebuttal and Further Econometric Evidence," prepared by The Law and Economies Consulting Group. While this 110-page report is dated July 7, 1995, it was not filed with the Commission (or served on us) until July 11, after our meeting with you. As I explained in our telephone conversation today, the report does not provide any effective refutation of Professors Williamson and Woroch's critique of LECG's earlier work. If you need additional information, please feel free to contact me.

If you have any questions, please do not hesitate to call.

Sincerely yours,

W. Stephen Smith

W. Stephen Smith
Counsel for the Coalition
to Enhance Diversity

Enclosure

cc: William F. Caton, Acting Secretary
Alan Aronowitz, Esq.

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Noll, Peck + McGowan's Welfare Estimates

Measure of Welfare

Using a Cobb-Douglass quasilinear utility function, aggregate consumer surplus can be written as:

$$\frac{W}{N_0 \bar{Y}} = \frac{\ln T}{1+\ln T}$$

where W = aggregate c.s. and

$$\ln T = \ln\left(\frac{\beta_0^c}{\beta_0^f}\right) + \sum_{i=A,I,E,D} \lambda_i \ln(1+N_i)$$

"A" refers to affiliates, "I" to independents, and so on.

If we simply compare a given number of affiliated and independent stations (N_A, N_I) to no stations at all, this last expression becomes

$$\ln T = \lambda_A \ln(1+N_A) + \lambda_I \ln(1+N_I)$$

because in that case $\beta_0^c/\beta_0^f = 1$ (see Noll et. al, p 283)

We can then compute welfare as a percentage of average household income for any combination of stations using:

$$\omega = \frac{W}{N_0 \bar{Y}} = \frac{\lambda_A \ln(1+N_A) + \lambda_I \ln(1+N_I)}{1+\lambda_A \ln(1+N_A) + \lambda_I \ln(1+N_I)}$$

See footnote to Table A-2 in Noll, et. al.

Confidence Intervals for Point Estimates

Using coefficient estimates from the linear regressions, $\hat{\lambda}_i$, we have:

$$\frac{\hat{\lambda}_i - \lambda_i}{se_i} \sim t^2_{N-K}$$

(se_i = standard error of coefficient i)

where $n-K = 31-7 = 24$ degrees of freedom. Therefore the $100(1-\alpha)\%$ confidence interval for the ith coefficient is:

$$\left[\hat{\lambda}_i - t_{\alpha/2}\cdot se_i\,,\ \hat{\lambda}_i + t_{\alpha/2}\cdot se_i\right]$$

So, e.g., the 95% confidence interval for λ_A, the coefficient on the number of affiliate stations is

$$[0.0385-(2.064)(0.0093),\ 0.0385+(2.064)(0.0093)]$$

or equivalently, $[1.9\%, 5.8\%]$

Similarly for λ_I, we find $[-0.1\%, 2.1\%]$ so that the CI's of the two coefficients <u>overlap</u>.

A more precise test to determine whether affiliate or independent stations contribute more to welfare is a test of the hypothesis: $H: \lambda_A = \lambda_I$. This can be done using the statistic

$$\frac{(\hat{\lambda}_A - \hat{\lambda}_I) - (\lambda_A - \lambda_I)}{\hat{s}\,(S^2_{AA} - 2S_{AI} + S^2_{II})^{1/2}} \sim t^2_{n-K}$$

where S_{ij} is (i,j) the element of $(X'X)^{-1}$, where X is matrix of all independent variables.

This test reduces to the above comparison of the two C.I.'s provided S_{AI}. Noll, et. al. do not provide this information. Note, however, that the sample covariance between the number of affiliated and independent station must be nearly zero because there are exactly three networks in each of the markets. In that case, S_{AI} will be nearly zero.

<u>Confidence Intervals for Welfare Estimates</u>

To form C.I.'s for the $W/N_p Y$ measures of welfare, note that, since $\frac{\hat{\lambda}_i - \lambda_i}{se_i} \sim t_{n-k}$, we have:

$$\Pr\left(\hat{\lambda}_i - t_{\alpha/2} \cdot se_i \le \lambda_i \le \hat{\lambda}_i + t_{\alpha/2} \cdot se_i\right)$$

$$= \Pr\left(\ln(1+N_i)[\hat{\lambda}_i - t_{\alpha/2} \cdot se_i] \le \ln(1+N_i)\lambda_i \le \ln(1+N_i)[\hat{\lambda}_i + t_{\alpha/2} \cdot se_i]\right)$$

$$= \Pr\left(1/\ln(1+N_i)[\hat{\lambda}_i + t_{\alpha/2} \cdot se_i] \le 1/\lambda_i \ln(1+N_i) \le 1/\ln(1+N_i)[\hat{\lambda}_i - t_{\alpha/2} \cdot se_i]\right)$$

$$= \Pr\left(\frac{1}{1 + 1/\ln(1+N_i)[\hat{\lambda}_i - t_{\alpha/2} \cdot se_i]} \le \frac{1}{1 + 1/\lambda_i \ln(1+N_i)} \le \frac{1}{1 + 1/\ln(1+N_i)[\hat{\lambda}_i + t_{\alpha/2} \cdot se_i]}\right)$$

$$w_i = \frac{\lambda_i \ln(1+N_i)}{1 + \lambda_i \ln(1+N_i)}$$

For example, for w_A, the 95% C.I. is

$$\frac{1}{1 + 1/\ln(4)[0.0385 \pm (2.064)(0.0093)]}$$

or, (2.61%, 7.41%)

VIEWER WELFARE FOR VARIOUS COMBINATIONS OF NETWORK AND INDEPENDENT STATIONS

Independent Stations

Affiliate Stations	0	1	2	3	4	5	6	7
0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
1	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
2	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
3	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
4	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

Note: Viewer welfare measured in percent of average household income.

Variable	Coefficient Estimate	Std Error	t Value	Lower Bound	Upper Bound	Welfare Estimate	Lower Bound	Upper Bound
Affiliates	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Independents	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

Note: 95% confidence intervals overlap for both coefficient estimates and welfare estimates.